

NINE OR TEN TYPHOONS IN THE FAR EAST DURING JULY, 1924

By Rev. José CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

No less than 9 or 10 typhoons were shown in our weather maps during last July, although only 2 passed very close to the Philippines and none of them did any considerable damage to our archipelago.

Two Loochoo typhoons.—The first typhoon of the month was the most important and the best developed. It was probably formed on the 5th to the ENE. of Guam, not far from 150° longitude E. and 16° latitude N. It moved practically W. until the afternoon or evening of the 8th, when it recurved to NW. and N. in the neighborhood of 130° longitude E. and 17° latitude N. From that time it went straight to the Loochoo Islands, striking Okinawa Islands, the central of the Loochoos, in the morning of the 11th. Observations received from Naha Observatory, Okinawa, through the courtesy of the director of Taihoku Observatory, Formosa, are as follows:

Date	Barometer	Wind
11th:	<i>Mm.</i>	<i>M. p. s.</i>
2 a. m.	738.4	ENN. 43.
6 a. m.	725.9	NE. 38.
Noon.	726.5	S. 34.

From Okinawa the typhoon inclined to NNW. and WNW. across the Eastern Sea and entered China about 120 or 150 miles north of Shanghai during the night of the 12th to 13th.

The approximate positions of the center for 6 a. m. of July 7 to 13 are as follows:

July 7.	139° 45' longitude E., 16° 35' latitude N.
July 8.	133° longitude E., 16° 50' latitude N.
July 9.	128° 50' longitude E., 18° 30' latitude N.
July 10.	128° longitude E., 20° 45' latitude N.
July 11.	127° 45' longitude E., 25° 20' latitude N.
July 12.	124° 50' longitude E., 30° 35' latitude N.
July 13.	117° 30' longitude E., 34° 05' latitude N.

The other typhoon of the Loochoos was of much less importance. It appeared as forming on the 14th to 15th close to the Bashi Channel northeast of the Batanes Islands. After moving NE. on the 15th and morning of the 16th, it took a northerly direction between Ishigaki-hima and Naha, but it probably filled up on the 18th over the Eastern Sea to the E. of Shanghai.

Batanes and Formosa typhoon.—We are waiting for more observations and particularly for the official report of Taihoku Observatory, Formosa, in order to be sure of the track of this typhoon as shown by our weather maps. In case it be confirmed, it will have to be considered as the most peculiar and abnormal track ever observed in the Far East, at least in recent years.

The typhoon appeared on the 7th over the Pacific to the E. of the Batanes Islands, between 124° and 125° longitude E., 20° and 21° latitude N. It moved W. by N., traversing the Bashi Channel with this direction on the 8th; it was shown SW. of Formosa on the 9th; and on the 10th to 11th it was noticed moving back to ENE., crossing again the Bashi Channel into the Pacific. Then it went up northeast toward the southern part of the Loochoos, where it recurved again on the 13th to the N., NW., W., and SW., traversing Formosa with the latter direction during the night of the 15th to 16th. It continued moving SW. until the 18th, when it probably filled up near or over the Paracels.

Four typhoons of the Pacific.—All of these typhoons were of a few days duration. The first was shown by our weather maps to the west of Guam on the 13th, near 141° longitude E. and 14° latitude N. It moved N.

on the 13th and 14th, and NW. on the 15th, filling up on the 16th between the Loochoos and the Bonins. The second typhoon was shown for two days on the 22d and 23d about 300 miles east of northern Luzon and the Balintang Channel. The other two typhoons were simultaneous from the 25th to the 29th: one moved northward 300 miles west of the Ladrone Islands between 15° and 20° latitude N., while the other moved NNW. to the E. of northern Luzon and Formosa. The latter was formed on the 25th to 26th near 127° longitude and 17° latitude, and filled up in about 122° longitude E. and 26° latitude N.

Three typhoons in the China Sea.—The first of these typhoons was formed on the 22d to 23d near 116° longitude E., and 19° latitude N.; it moved W. and reached the Hainan Strait on the 24th. The second was formed on the 26th west of northern Luzon near 116° or 117° longitude E. and 17° or 18° latitude N.; it moved f WNW. and filled up on the 28th or 29th near or over Hainan. The third typhoon appeared on the 29th near 116° longitude E. and 19° latitude N.; it moved westward for a while, but then it has remained almost stationary up to the present (August 1) in the neighborhood of 114° or 115° longitude and 19° latitude. Its further track will be described next month.

SOUTHWEST MONSOON IN ARABIAN SEA; GALES IN SOUTH PACIFIC OCEAN

By ALBERT J. McCURDY, Jr.

Arabian Sea.—Weather reports received from vessels that crossed the Arabian Sea during August indicate an increase in the activity of the southwest monsoon over that of the preceding month. Moderate to whole gales were experienced on somewhat more than one-third of the days for which reports have been received.

From the 2d to 6th the British S. S. *Clan Malcolm*, Capt. C. J. Higgins, Indian coast ports to New York, experienced southwesterly gales accompanied by rough and high seas in the vicinity of Socotra Island. Captain Higgins states that the lowest barometer, 29.60 inches, was recorded at 3:29 p. m. on the 4th in 12° 48' N., 53° 45' E. The wind at this time was SSW., force 10, later shifting to W. by S., and decreasing to force 2-3 on the 5th. But on the 6th, at 3:03 p. m., it had again increased to gale force from the SW. by W.

The Dutch S. S. *Vechtdijk*, Capt. K. Pann, Colombo to Suez, from the 2d to 5th experienced southwesterly winds of force 7. The observer, Mr. D. van du Horst, reports that the lowest pressure observed was 29.59 inches, occurring at 3:26 p. m. on the 5th in 11° 14' N., 51° 30' E.

On the 7th the American S. S. *Astral*, Capt. R. C. Doull, Port Said to Karikal, India, encountered a moderate to fresh southwesterly gale accompanied by heavy seas. Mr. S. K. Miller, second officer, reports that the lowest pressure observed was 29.76 inches (uncorrected), occurring at 3:47 p. m. in 13° 05' N., 56° 45' E. The wind at the time was SW., force 7 and 8.

The British steamships *Hyson* and *Suncliff* on August 13 and 16th, respectively, while in the vicinity of Socotra Island, experienced almost identical conditions to those reported by the *Astral*.

On the 20th and 21st the British S. S. *City of Naples*, Capt. H. Johnson, Penang to Colombo, experienced southwesterly winds of force 7 to 8, accompanied by rough seas. Mr. R. C. Cooper, observer, states that the lowest barometer recorded was 29.60 inches (uncorrected), occurring at 3:35 p. m. on the 21st in 12° 45' N., 53° 49' E.

South Pacific Ocean.—Of the several cyclonic disturbances reported in the South Pacific Ocean during August, only one of any significance occurred. This was a depression off the coast of Chile that appeared on August 20 and which until the 23d occasioned moderate to whole gales, with accompanying heavy snow and rain squalls. The Danzig S. S. *Gedania*, Capt. L. Schroeder,

Buenos Aires to San Pedro, came within its influence on the 20th. Mr. F. Hesse, third officer, reports that the lowest pressure observed was 28.78 inches, occurring at 4 a. m. on the 20th in the Straits of Magellan. The wind at the time of lowest pressure was W. by N., force 7-8. By the 23d the gale had increased to force 8-10 from the southwest.

551.506 (73) DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

The feature of the month was the very pronounced excess in precipitation over the upper Mississippi Valley and a much less excess over North Pacific Coast States, northwest Texas, and portions of the New England and Middle Atlantic States. (See inset on Chart IV.) This fact may or may not be significant of a return to normal rainfall in those regions that have experienced a shortage in the last few months.

Temperature was uniformly above normal in the South and in a less degree in some portions of the North. (See Chart III.) The usual details follow.

CYCLONES AND ANTICYCLONES

By W. P. DAY

There were few well-defined cyclonic disturbances charted over the United States during the month, the interchange between polar and equatorial air being evidenced in most cases by a line of discontinuity separating the northerly from the southerly winds in a trough of lower pressure moving eastward across the country. Within these troughs local areas of diminished pressure gave some evidence of cyclonic circulation and their day-to-day movement could be charted; but at all times the great troughs of which these low areas were a part were the important features of the weather charts.

On the other hand, over the adjacent portion of the Atlantic Ocean two tropical cyclones developed and reached hurricane intensity. A detailed description of these two storms is given under the section devoted to storms and weather warnings for the Washington Forecast District and also under the section headed "North Atlantic Ocean."

The high-pressure areas were mostly of the Alberta type, and were, as a rule, quite regular in movement and persistent as individual areas.

FREE-AIR SUMMARY

By V. E. JAKL, Meteorologist

Tables 1 and 2 well represent the upper-air conditions that prevailed at the six aerological stations during the month. As will be noted, the departures from normal were on the whole of almost negligible value. Furthermore, the record shows what is not revealed in the tables, that, with not many important exceptions, the conditions on individual days were practically the same as the averages for the month. This equable condition of the upper air naturally resulted from the lack of cyclonic activity during the month. (See Cyclones and Anticyclones above.)

Considering first the temperature, it is apparent that the lapse rate was of about normal value at all stations; consequently the slight departures in temperature that prevailed on the ground extended vertically with but little change. Therefore Chart III, this REVIEW, showing for the surface slightly cooler weather than normal over northern sections and slightly warmer weather over southern sections, applies as well to the upper air for sections east of the Rocky Mountains.

Relative humidity was quite uniformly normal or close to normal at all elevations at the various stations, which, combined with approximately normal temperatures, gave vapor pressures that were also about normal, as the computed results show in Table 1. However, the departures from normal in relative humidity and vapor pressure, unless of pronounced magnitude, are of little significance, inasmuch as the vapor content of the upper air can change rapidly, while the kite flights, on which the averages are based, are usually made in fair weather.

Winds, as shown by both kite and pilot-balloon observations, were generally about normal in direction and velocity, the usual direction for the greater portion of the country being from south to west. An approximate allocation of the normal winds for the month would be about southwest for the middle valley region and about west for the eastern portion of the country, with a general tendency toward veering somewhat with altitude. An important exception, however, in the prevalent winds for the month is noted at Due West, where there was a decided northerly tendency at moderate and high elevations, in marked contrast to normal westerly winds. This deviation from the normal direction at Due West may be attributed to the unusual pressure distribution prevalent over the southeastern portion of the country, where the normal August condition of high pressure extending from the Atlantic and diminishing westward was conspicuously absent during the greater portion of the month. (See Storms and Weather Warnings, New Orleans Forecast District, p. 411-412.) At Key West and San Juan, balloon observations showed resultant winds from an easterly direction at all altitudes, which probably represents the normal wind condition at those stations. Easterly upper winds were observed also at many other stations (except the more northerly ones), particularly in the latter portion of the month. Such occurrences of easterly winds, however, were too infrequent and were associated with too low velocities to show an appreciable easterly component in the monthly resultants for any level.

A number of instances of high velocity observed in two-theodolite pilot-balloon observations are recorded. The value of these observations lies in the undeniable proof they give that such velocities actually occur quite frequently, as the acceptance of such observations is not dependent on confidence in the normal behavior of the balloons. Moreover, such observations prove beyond dispute the existence of high velocities aloft on days when, from the surface barometric gradients, low velocities to great depth might be construed. Outstanding instances of high velocities observed during the month by the two-theodolite method are as follows: On the 4th, Ellendale showed in a two-theodolite observation, a wind increasing from 0.6 meter per second on the ground to 38 meters per second at 9,500 meters altitude; and on the 9th, a wind velocity of 3 meters per second on the ground, increasing to 40 meters per second at 8,000 meters altitude. Broken Arrow, in a two-theodolite observation on the 25th, showed a light wind averaging